Method of coating metal using low temperature plasma and electrodeposition

Description of Technology: This invention relates to the use of low temperature plasma technology for the corrosion protection of metals. Our novel process involves pretreatment of the metal with a plasma gas, followed by plasma deposition of a thin polymer film, and finally application of an electrocoat primer.

Patent Listing:

1. **US Patent No. 5,182,000**, Issued January 26, 1993, "Method of coating metal using low temperature plasma and electrodeposition"

http://patft.uspto.gov/netacgi/nph-Parser?Sect2=PTO1&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&d=PALL&RefSrch=yes&Query=PN%2F5182000

Market Potential: The corrosion protection of steel substrates is important for many industries, including the automotive and steel industries. Currently the most common methods of corrosion protection of steel substrates are galvanizing, application of zinc phosphate, application of primer materials by electrodeposition, conventional spray or dip priming, oil coating and combinations thereof. However, especially in the automotive industry, these methods are associated with pollution in the form of volatile organic compounds (VOC), (2) excessive waste disposal, (3) inadequate coverage of recessed areas, and (4) inadequate retention or performance of corrosion protection.

It has been discovered that improved corrosion resistance of steel or other metals can be realized by: (1) plasma pretreatment of the metal with a gas comprising hydrogen, argon, or a mixture thereof; (2) plasma deposition of a thin polymeric film; and (3) cathodic electrodeposition of an organic primer coating.

Benefits:

- Improved corrosion resistance of steel and other metals
- Less pollution of volatile organic compounds

Applications:

- Automotive and steel industries

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